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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/091,699

03/04/2002

Robert P. Mandal

AMAT/3771.P1/DD/LOW  
K/JW

7928

32588

7590

02/26/2003

APPLIED MATERIALS, INC.  
2881 SCOTT BLVD. M/S 2061  
SANTA CLARA, CA 95050

EXAMINER

RAO, SHRINIVAS H

ART UNIT

PAPER NUMBER

2814

DATE MAILED: 02/26/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/091,699

Applicant(s)

MANDAL, ROBERT P.

Examiner

Steven H. Rao

Art Unit

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 29 January 2003.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1 to 18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) 1 to 18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 6 & 7.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

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***Response to Amendment***

Applicants' amendment filed on November 25, 2002 has been entered on December 17, 2002.

Therefore claims 1, 2,5, 10, 11,16 as amended by the amendment and claims 3-4,6-9,12-15 and 17-18 are as originally recited are currently pending in the application.

Claims 19 and 20 have been cancelled by this amendment.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1 to 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Grill (U.S. Patent No. 6,312,793, herein after Grill) previously applied and Tsukune et al. (U.S. Patent No. 5,314,724, herein after Tsunkune) cited by the applicants in their IDS newly applied.

With respect to claim 1 Grill describes a method for depositing a low dielectric constant film including introducing a siloxane comprising two or more silicons and four or more methyl groups bonded to the silicons into a processing chamber (Grill col.3 lines 15-20) introducing at least one oxiidizable chemical.

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Grill does specifically describe the oxidizable chemical as comprising a member selected from the group consisting of tertiabutoxy, furfuryl, furfuryloxy and neopentyl into the processing chamber.

Tsukune, describes in col. 7 lines 45-46 oxidizable chemicals including tertiabutoxy to provide a process chemicals for the formation of a planarized insulation film having desired thickness and high reliability.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to include Tsukune's oxidizable chemicals including tertiabutoxy in Grill's process steps to provide a process chemicals for the formation of a planarized insulation film having desired thickness and high reliability. ( Tsukune col. 1 lines 50-55).

The other limitations of claim 1 are :

reacting the siloxane and the at least one oxidizable chemical with an oxidizing gas at a temperature that retains the member in a conformal layer ( Grill figs. 2A and B, col. 6 lines 54-61),and annealing the conformal layer at a temperature sufficient to convert the member to dispersed voids. ( Grill col. 8 lines 29-30).

With respect to claim 2 in addition to the steps of claim 1 above it recites that reacting the siloxane retains two or more members in the conformal layer (Grill figs. 2A and B, col. 6 lines 54- col. 7 line 10).

With respect to claims 3-4 wherein the one oxidizable chemical comprises furfuryl ether, teriaryybutylfurfuryl ether and neopentylfurfuryl ether ( col. 3 lines 51-53 and col. 3 lines 33-37).

With respect to claim 5 it repeats the steps of claim 1 above wherein the one oxidizable chemical comprises silicon ( Grill col. 3 line 14).

With respect to claims 6-7 wherein the oxidizable chemical is silane and the silane is dimethylfurfuryloxy silane ( Grill col. 3 line 20).

With respect to claims 8 -9,11,14-16 wherein the at least one oxidizable chemical is disiloxane: 1,3 dimethyl- 1,3- ditertiabutyl disiloxane and 1,3-dimethyl- 1,3-ditertiarybutoxy disiloxane ; 1,1,3,3-tetramethyldisiloxane, 1,3,5,7-tetramethylcyclotetrasiloxane ; 1,3-dimethyl-1,3-ditertiarybutyl disiloxane; 1,3-dimethyl-1,3-ditertiarybutoxy disiloxane . ( Grill col. 3 lines 14-26 and Tsukane col. 7 lines 35-65).

With respect to claims 10 and 13 wherein the at least one oxidizable chemical is 1,1, ditertiarybutylethylene ( Grill col. 3 lines 49-53).

With respect to claims 12,17 wherein the at least one oxidizable chemical is tertiarybutylfurfuryl ether ( Grill col.3 line 34-35).

With respect to claim 18, wherein the method further comprises depositing a silicon carbide layer on the conformal layer prior to annealing the conformal layer. ( Grill col. 54-col. 6 lines 12).

### ***Response to Arguments***

Applicant's arguments with respect to claims 1 to 18 have been considered but are moot in view of the new ground(s) of rejection.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

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§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

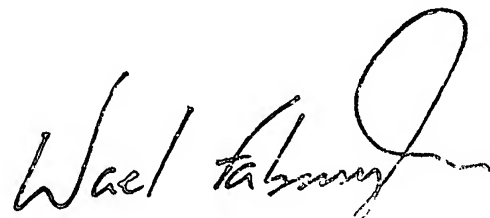
Any inquiry concerning this communication or earlier communication from the examiner should be directed to Steven H. Rao whose telephone number is (703) 306-5945. The examiner can normally be reached on Monday- Friday from approximately 7:00 a.m. to 5:30 p.m.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (703) 308-0956. The Group facsimile number is (703) 308-7722.

  
Steven H. Rao

Patent Examiner

February 21, 2003.

  
SUPERVISORY PRIMARY EXAMINER  
TECHNOLOGY CENTER